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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,360	08/22/2003	Apparao M. Rao	CXU-400	8625
22827	7590	06/29/2006	EXAMINER	
DORITY & MANNING, P.A. POST OFFICE BOX 1449 GREENVILLE, SC 29602-1449			FULLER, ERIC B	
			ART UNIT	PAPER NUMBER
			1762	
DATE MAILED: 06/29/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/646,360

Applicant(s)

RAO ET AL.

Examiner

Eric B. Fuller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 12, 2006 has been entered.

### ***Response to Arguments***

Applicant argues that the amendments overcome the rejections of the previous Office Action. This is not found convincing. As discussed in the interview, a limitation that differentiates the present invention from the template method of the prior art would overcome the rejections of the previous Office Action. However, the present amendments do not provide this differentiation. The deposited metal in the prior art still reads on being a metal layer. If the applicant wishes to argue that the present invention uses a continuous, uniform metallic layer that is deposited over the entire surface of the substrate while the prior art has a discontinuous layer formed on the substrate, then the claims need to clearly limit the invention to such an arrangement. The examiner has not given the claims this interpretation because this limitation is not present and it is unclear if this is what the applicant is arguing.

Applicant's arguments have not been found convincing. The rejections of the previous Office Action have been maintained accordingly.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Majumdar et al. (US 2002/0172820).

Majumdar teaches the applicant's claims in example 1. Specifically, a metal is melted at temperatures between 600-800 degrees Celsius, a reactant source of Si, Ge, or ZnO is fed and reacted, and the product forms nanometer sized droplets than grow into nanowires. The formation of the droplets reads on the wetting characteristics claimed. All other limitations are read upon as discussed in the previous Office Action in which this reference was used as a secondary reference.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma et al. (US 2003/0039602 A1).

Sharma teaches a method of depositing gallium droplets to a graphite substrate, melting the gallium, and reacting the melt pool with oxygen gas in order to form a nanowire (example 2). Although the reaction temperature is taught to be lower than that claimed, this is made possible by pre-forming the catalyst droplets instead of using heat to cause the droplets to pre-form (abstract, paragraph 49). From this teaching, one of ordinary skill in the art would recognize that a process that does not use pre-formed droplets and uses a higher temperature to accomplish this action is a viable option for producing nanowires when energy costs are not considered. Even if the droplets are pre-formed, the higher temperature would still perform the process as indicated, just without the improvements taught. In essence, by teaching the improvement of using lower temperatures, the reference has shown that the claimed invention is known, or at least obvious. Thus, the reference at least makes obvious the claimed invention.

Claims 11-37 rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma et al. (US 2003/0039602 A1), as applied to claims above, and further in view of Majumdar et al. (US 2002/0172820 A1).

Sharma teaches the limitations above, but is silent to forming doped or hybrid nanowires. However, Majumdar teaches that by using a second reactant gas, hybrid

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and/or doped nanowires may be produced (examples 1 and 2). The benefit is that the nanowires have exploitable characteristics along the lengths of their surfaces.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to use a second reactant to form doped and/or hybrid nanowires. By doing so, one would reap the benefits of multiple exploitable characteristics along the lengths of the nanowires.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Fuller whose telephone number is (571) 272-1420. The examiner can normally be reached on Mondays through Thursdays.

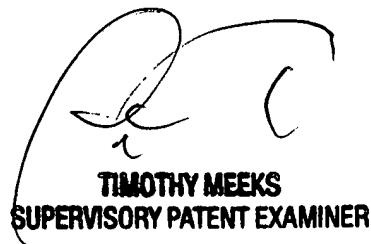
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks, can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



EBF



**TIMOTHY MEEKS**  
**SUPERVISORY PATENT EXAMINER**